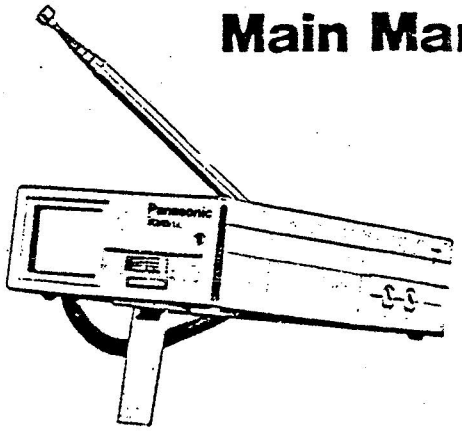
Service Manual

Black and White Television

TR-1010P

Original

Chassis Model No. 1M01-A
Chassis Family No. M01
Main Manual



The Service Technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this Service Manual.

SPECIFICATIONS:

Power Source:	AC: 120V, 60Hz. DC: 6V
Power Consumption:	AC: 4.5W DC: 1.8W
Antenna Impedance:	UHF/VHF Monopole Antenna. 75Ω, Unbalanced type.
Receiving Channel:	U.S.A. Standard VHF: 2-13 UHF: 14-83
Intermediate Frequency:	Video: 45.75MHz Sound: 41.25MHz
Integrated Circuits:	8 IC's
Semiconductor:	12 Transistors 25 Diodes 1 Thermistor
Audio Output:	100mW Maximum
Nominal Anode Voltage:	4.7kV (Zero Beam Current)
Picture Tube:	40CB4M 1.5" 36° Deflection
Speaker:	1-3/4 inches, 16Ω, Round type.
Automatic Circuit:	Peak Automatic Gain Control Saw-Tooth Automatic Frequency Control Automatic Voltage Regulator
Dimensions:	Height: 1-1/2 inches (38mm) Width: 3-1/2 inches (88.5mm) Depth: 6-1/4 inches (159mm)
Weight:	1 lbs. (0.45kg) without dry Battery
Standard Accessories:	AC Adaptor (TY-AC39P) Earphone (XEH15A2-B1) Car Battery Cord (TSX8366B) Rechargeable Battery (TY-378) Battery Case (TJB80926) Headphone Adaptor (TJS868680) Lens Hood (TKK800563)
Optional Accessorise:	Car Battery Cord (TY-NC32P) Rechargeable Battery (TY-378) Headphone (EAHS-3)

Specifications are subject to change without notice.

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THIS MODEL COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE.

SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. It is advisable to insert an isolation transformer between the television set and the AC power line before servicing the chassis.
2. In servicing, pay attention to the original lead dress, especially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result the short circuit.
3. After servicing, observe that all the protective devices such as insulation barriers, insulation papers, shields, isolation and R-C combinations, are properly installed.
4. Before turning the receiver on, check the resistance between the B+ line and chassis ground. Connect ⊖ side of an ohmmeter to B+ line and ⊕ side to ground. Each line should have more resistance than specified below.

B+ line	Minimum Resistance
4.8V	25Ω

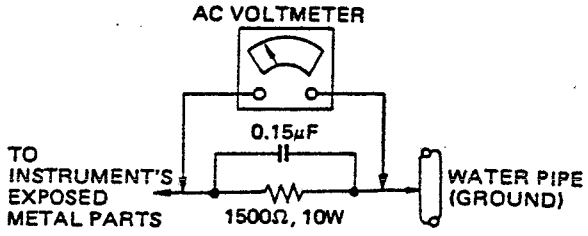
5. When the TV set will not be used for a long period of time, unplug the power cord from the AC line outlet.
6. Potentials as high as 4.7kV are present when this receiver is operating. Operation of the receiver without the rear cover on involves danger of shock.
   Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment. Always discharge the anode of the picture tube to the receiver chassis before handling the tube.
7. After servicing make the following leakage current check to prevent the customer from undergoing shock hazard.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Turn the receiver power switch on.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metallic part such as screwheads, antennas, control shafts, handle bracket, etc. When the exposed metallic part has a return path to the chassis, the reading should be 1.8 megohm to 4 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity.
4. Remove the jumper from the AC plug.

LEAKAGE CURRENT HOT CHECK

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during this check.
2. Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15μF capacitor between each exposed metallic part and a good ground like a water pipe as shown in Figure.
3. Use an AC voltmeter with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Move the resistor connection to each exposed metallic part and measure the voltage.
5. Reverse the polarity of the AC plug in the AC outlet and repeat the above measurement.
6. The potential must not exceed 0.75 volt RMS, from any exposed metal part to ground. In case any of the measurements are not with in the limits specified, there is a possibility of a shock hazard and the receiver should be repaired and rechecked before it is returned to the customer.



X-RADIATION

WARNING: The potential source of X-Radiation in TV sets is the picture tube.

NOTE: It is important to use an accurate, periodically calibrated, high voltage meter.

1. Turn the Brightness control fully counterclockwise.
2. Measure the High Voltage. The high voltage meter should indicate a nominal 4.7kV and the maximum 6.0 kV. If the upper meter indication exceeds the maximum level, immediate service is required to prevent the possibility of premature component failure.
3. To prevent a possibility of x-radiation, it is essential to use the specified picture tube.

IMPORTANT SAFETY NOTICE

There are special components used in Panasonic TV sets which are important for safety. These parts are identified on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of Matsushita Electric.

The electrical parts used in this model-such as the resistors, the capacitors and the transistors, are smaller than the same parts used in conventional models. Very painstaking and careful servicing techniques, therefore, are necessary for this model.

DISASSEMBLY INSTRUCTIONS

UPPER CABINET REMOVAL

1. Remove 2 screws Ⓐ as shown in Fig. 1.
2. Remove the rod antenna as shown in Fig. 2.
3. Hold the bottom part of the cabinet and lift the upper part while pushing towards you as shown in Fig. 2.

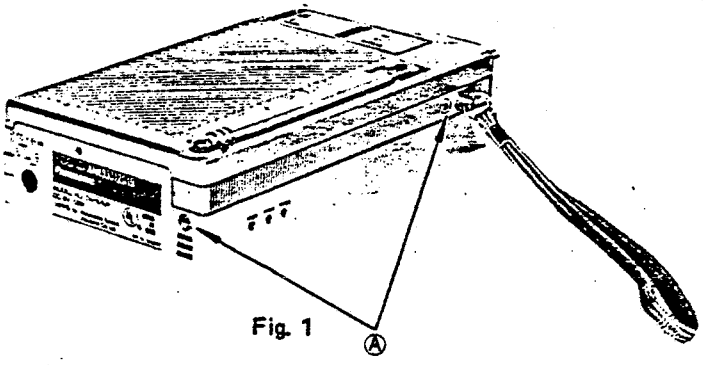


Fig. 1

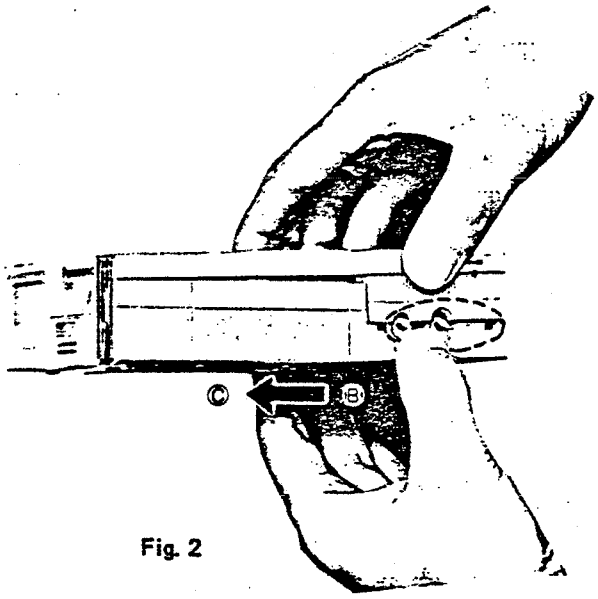


Fig. 2

SPEAKER REMOVAL

1. Remove the upper cabinet.
2. Take off picture tube taping.

CIRCUIT BOARD REMOVAL

1. Remove the power lead 3p connector Ⓓ as shown in Fig. 3.
2. Pull the escutcheon in the direction of arrow Ⓔ as shown in Fig. 3.
3. Place the unit as shown in Figures 3 and lift the bottom cover.

AUDIO P.C. BOARD REMOVAL

Pull the audio P.C. Board in the direction arrow Ⓕ as shown in Fig. 3.

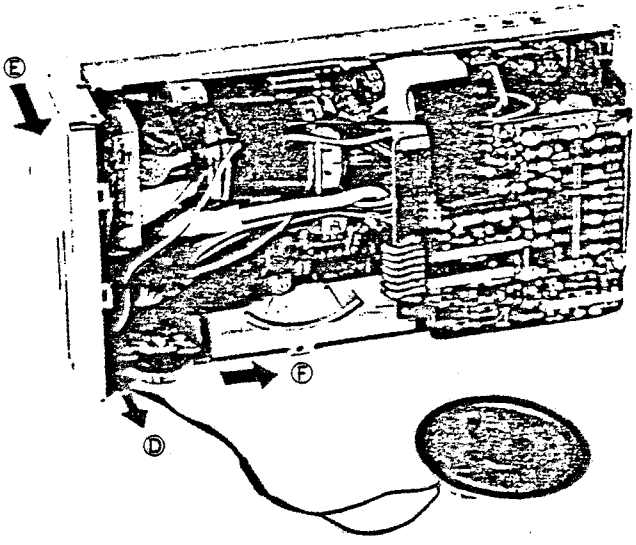


Fig. 3

ESCUTCHEON REMOVAL

1. Remove the picture tube label.
2. Pull the picture tube.
3. Remove the escutcheon front protector and panel as shown in Fig. 4.

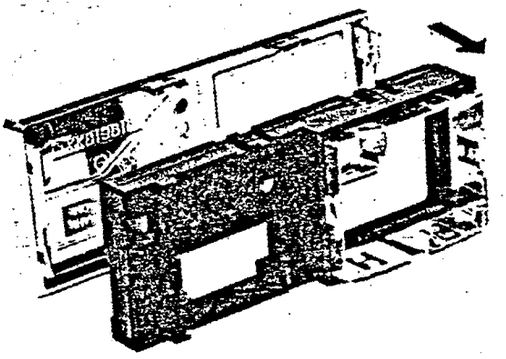


Fig. 4

HOW TO REPLACE CHIPS (RESISTOR, CAPACITOR, JUMPER)

1. Remove solder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 5.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig. 6.

NOTES:

1. Do not use chip again which is removed from P.C. Board.
2. Use lead wire with insulator for replacement instead of chip jumper.

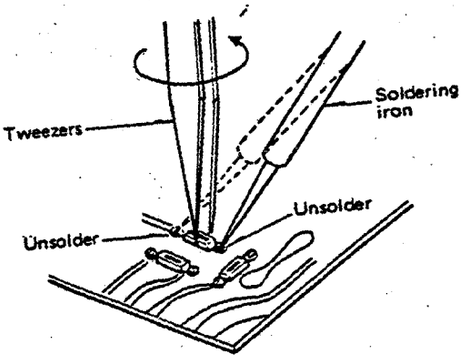


Fig. 5

NOTE FOR REPLACING CHIPS

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60 W) and tweezers for replacing chips.

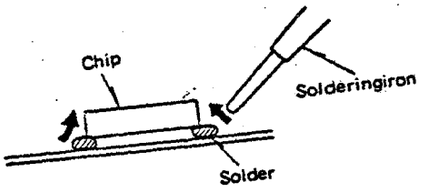


Fig. 6

DRY BATTERY OPERATION

Insert 4 "AA" size dry batteries into the battery case supplied as shown in Fig. 7.

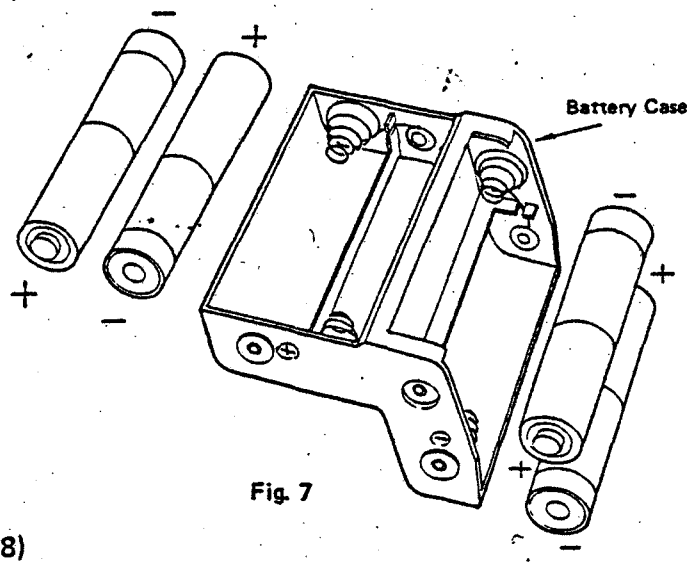


Fig. 7

RECHARGEABLE BATTERY OPERATION (TY-378)

To obtain maximum playing time, charge new battery for 8 hours befor using. For best battery life, it is recommended to recharge the battery after each use. Recommended charging time is 4 hours charge for 1 hour of use. (8 hours charge after 2 hours of battery operation.) To attain maximum battery life, the TV set should not be operated more than 2 hours without recharging the battery. And for best battery life, batteries should not be charged more than is necessary.

OPERATING TIME VS BATTERY TYPE

Panasonic Hi-Top UM-3D	Panasonic Supper-Top UM-3N	Rechargeable Battery Pack TY-378
About 1.5 hrs	About 2 hrs	About 2 hrs

TELEVISION INDICATOR ALIGNMENT

TELEVISION INDICATOR ALIGNMENT

1. Set the band selector to UHF position.
2. Set the pointer to the station which is the lowest receivable channel in your area.
3. Adjust VR92 to get the best picture.
4. Set the pointer to the station which is the highest receivable channel in your area.
5. Adjust VR93 to get the best picture.
6. Set the pointer same as step 2.
7. Readjust VR92 if necessary.
8. Set the band selector to VHF position.
9. Set the pointer to the station of which is the lowest receivable channel in your area.
10. Adjust VR94 to get the best picture.
11. Set the pointer to the station which is the highest receivachannel in your area.
12. Adjust the VR96 to get the best picture.

NOTES: The following conditions are required.

VHF: To obtain the best picture deviation of ±0.5CH from the correct tuning indication is acceptable.

UHF: To obtain the best picture deviation ±2CH from the correct tuning indication is acceptable.

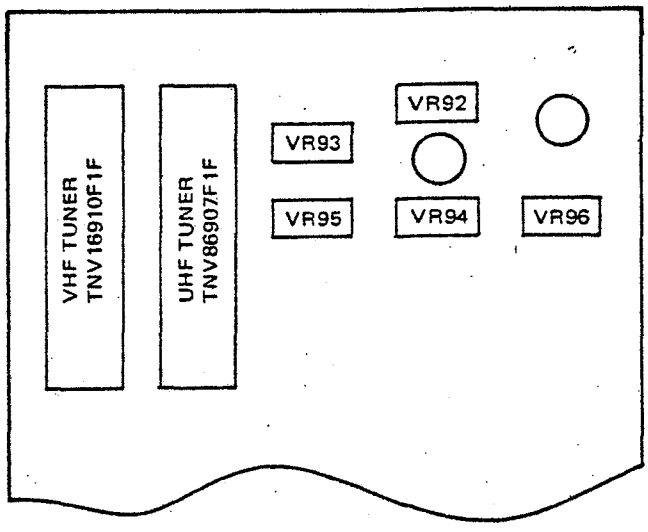


Fig. 8

FIELD ALIGNMENT OF TV

AVR (AUTOMATIC VOLTAGE REGULATOR)

Connect a voltmeter across TP74 and chassis. Make certain the B+ supply voltage is +4.8V ± 0.05V. Adjust the AVR control (VR71) if necessary.

YOKE POSITION

The yoke is secured to the neck of the picture tube with an angular clamp and screw. To Adjust the yoke and correct for picture tilt : Loosen the clamp screw, correct tilt, and retighten the clamp screw.

CENTERING

The picture centering device consists of two rings located at the rear of the yoke assembly. Each ring has a tab for ease of adjustment.

The tabs should be rotated and moved towards or away from each other until the picture is properly centered on the picture tube screen.

TO ADJUST THE R-F AGC PROPERLY

1. Tune in strong local station.
2. Turn the R-F AGC control (VR19) fully counter-clockwise.
3. Observe the input signal, turn the R-F AGC control (VR19) clockwise to the point where the snow noise disappears in the picture.
4. Check the reception with all channels. If the set does not get a clear picture on all channels, readjust the R-F AGC. (Assuming, that all channels have sufficient signal strength and are essentially free from interference.)

VERTICAL HEIGHT

Adjust the V-Height control (VR32) until picture becomes symmetrical from top to bottom.

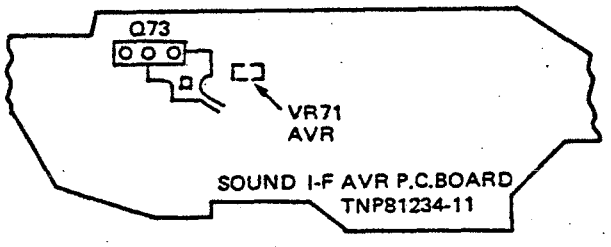


Fig. 9

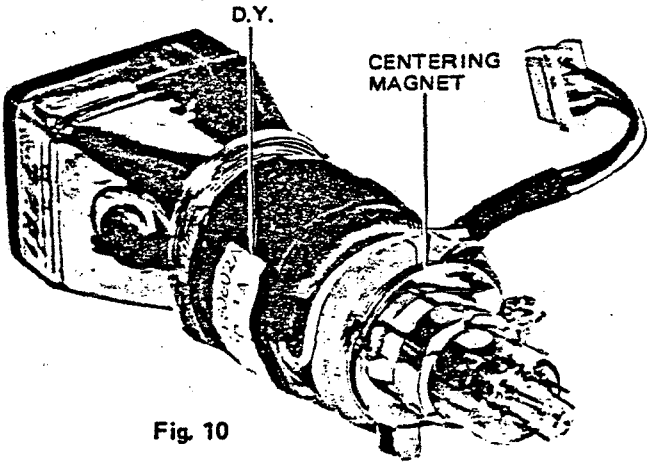


Fig. 10

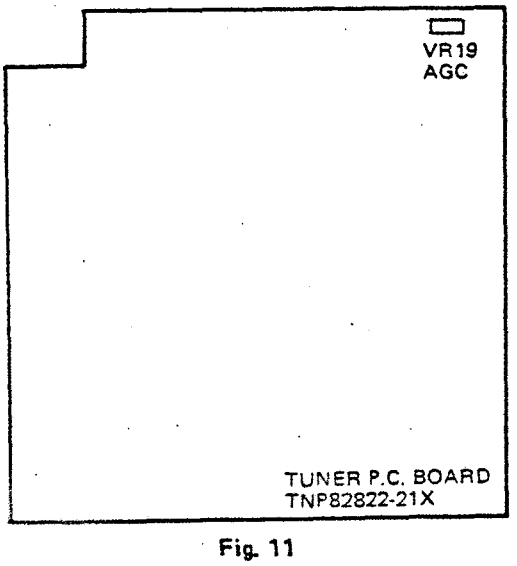


Fig. 11

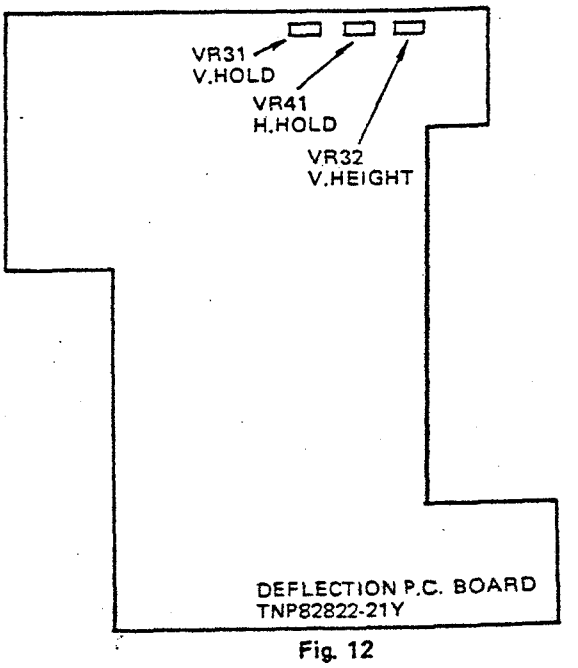
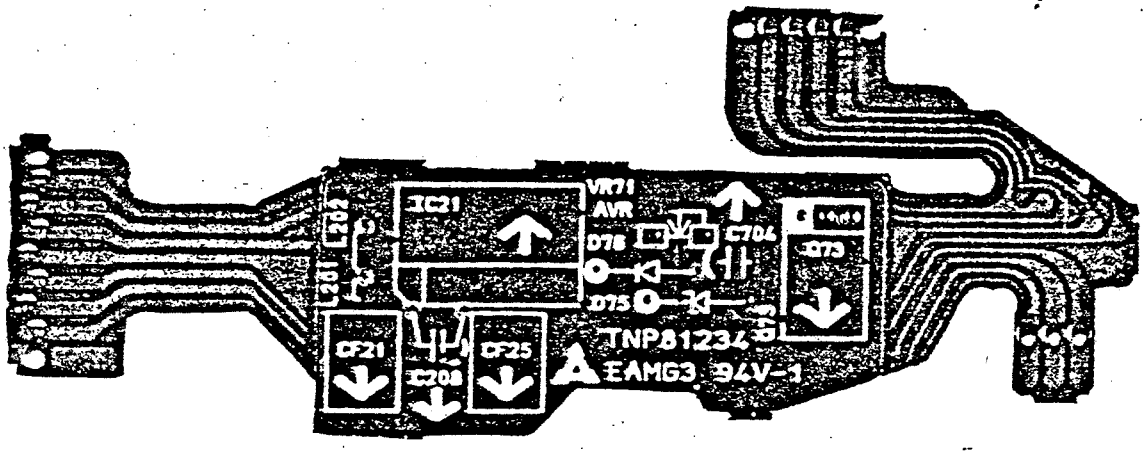


Fig. 12

FLEXIBLE PRINTED WIRING BOARDS



■ **Features**

1) Despite a conventional ribbon cable or tape wire in which wiring is limited to parallel running, the flexible printed wiring board has high-density free wiring capability to meet any wiring patterns.

2) The flexible printed wiring board ensures easy designing of a small-size equipment and light weight.

Solder Limits		Max Operating
Temperature	Time	Temperature
260°C	20sec.	95°C
468°F		171°F

■ **Method of soldering**

Parts to be soldered on the flexible printed wiring board form through holes.

1) Put the flexible printed wiring board on the printed circuit board by controlling the position as Fig. 13 shows.

2) Weld the flexible printed wiring board to the printed circuit board by holding a soldering iron to the printed circuit board, while holding the flexible printed wiring board from the reverse side, as Fig. 14 shows.

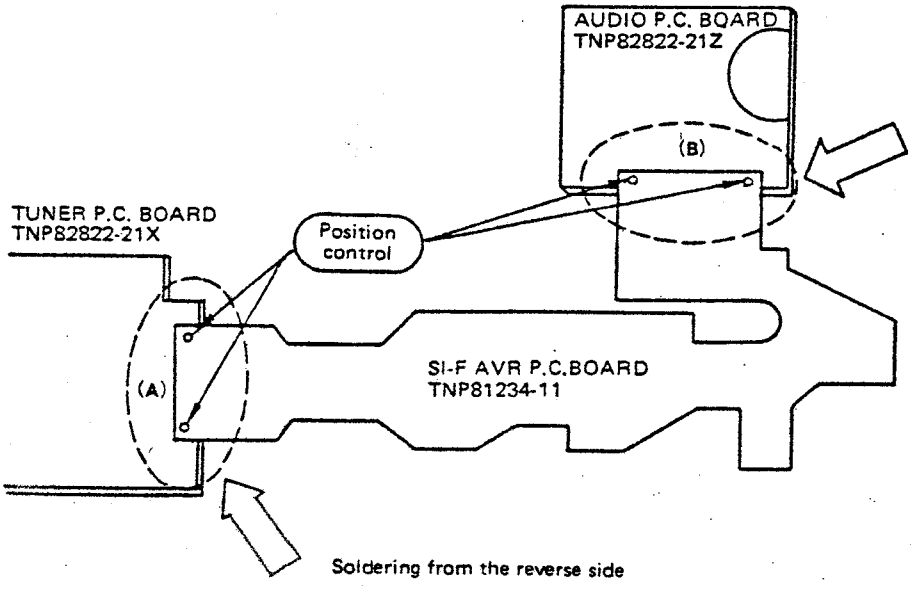


Fig. 13

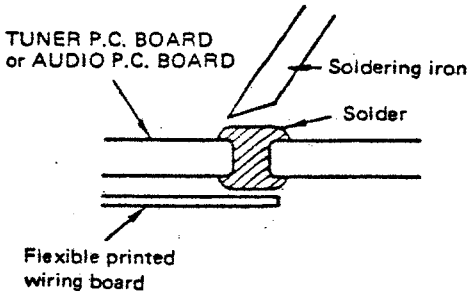
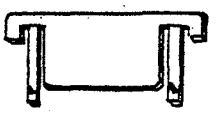


Fig. 14

■ **How to reinforce**

After soldering of flexible printed wiring board, reinforce the connecting parts by using two kinds of bushings shown below. (Refer to Fig. 13)

	Part No.	Parts to be used	Shape
Bushing B	TMM81926	Connecting part (A) of tuner P.C. board	
Bushing A	TMM81925	Connecting part (B) of audio P.C. board	

1. Insert the Bushing B from the flexible printed wiring board by corresponding to the designated position as Fig. 15 shows.

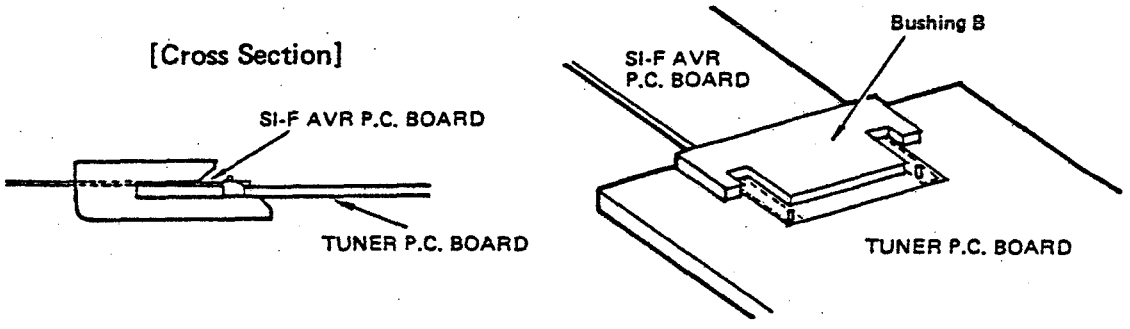
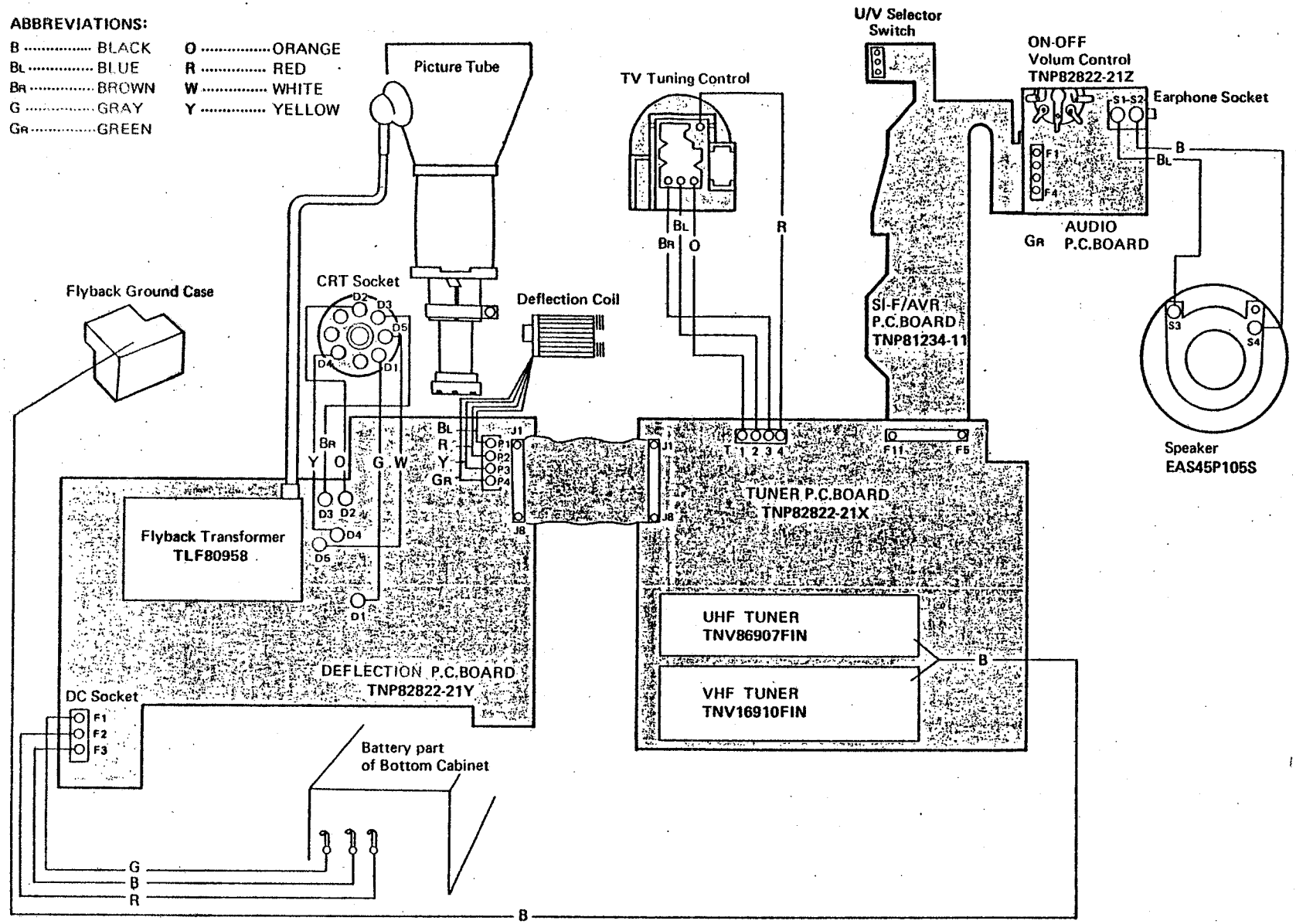


Fig. 15

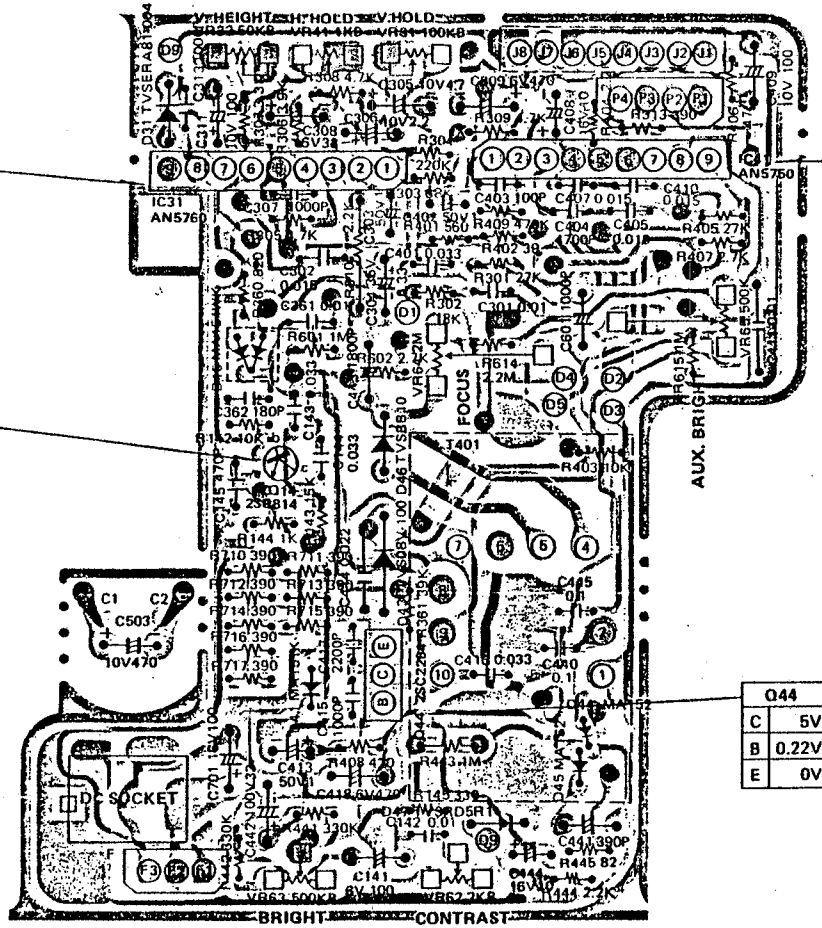
■ **Useful manuals**

1) Take care never to give pulling, breaking or excess bending force to the flexible printed wiring board. (It may cause snapping of a wire of the foil of the printed circuit board)
2) Never move the parts in the condition that heat is being given to the flexible printed wiring board. (It may cause foil crack)
3) Don't give heat to the flexible printed wiring board. (It results in falling-off and coming to the surface of deposited foil of the printed circuit board)

CONNECTION TABLE



DEFLECTION P.C.BOARD (TNP82822-21Y)



IC31			
1	2V	6	2V
2	2V	7	4.4V
3	1.3V	8	4.6V
4	1V	9	4.6V
5	0V		

IC41			
1	0.5V	6	4.2V
2	3V	7	1.2V
3	1.9V	8	2V
4	2V	9	1.9V
5	0V		

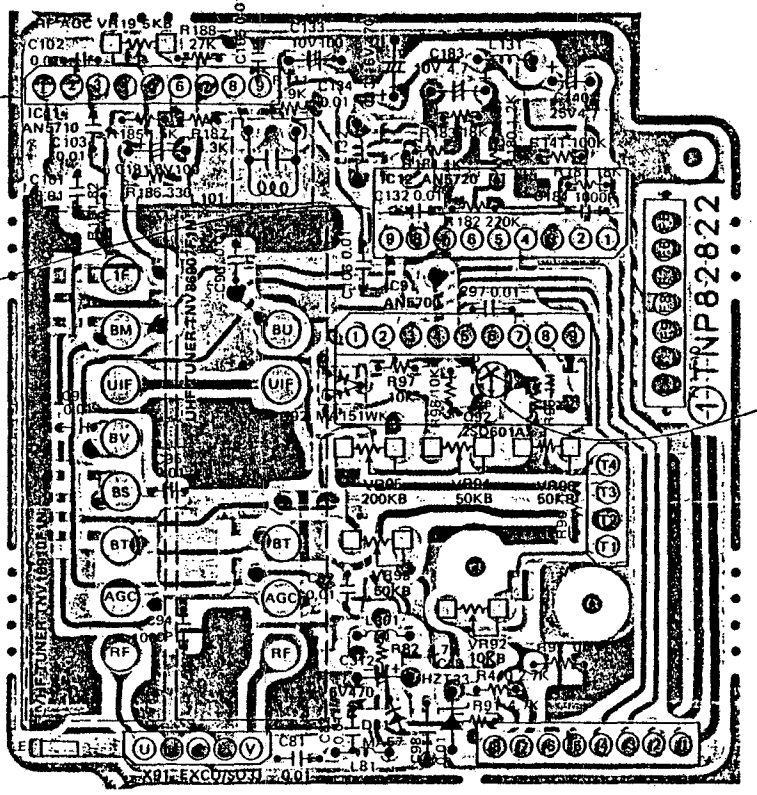
Q14	
C	22.5V
B	1.9V
E	1.3V

Q44	
C	5V
B	0.22V
E	0V

TUNER P.C.BOARD (TNP82822-21X)

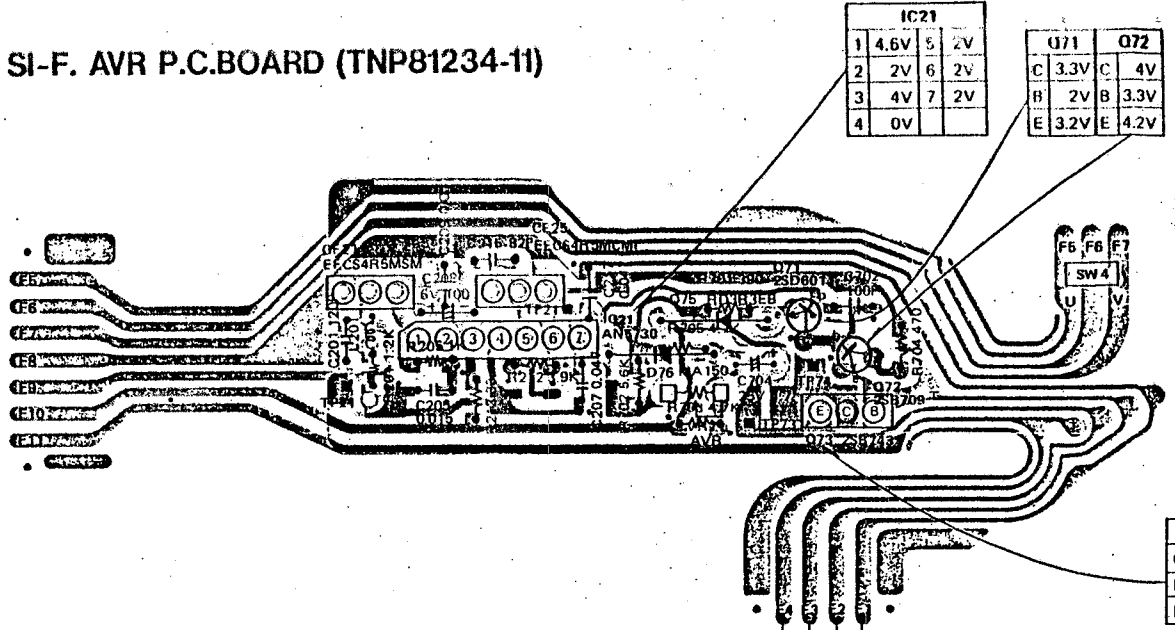
IC11			
1	1V	6	1.1V
2	1V	7	4.5V
3	0.2V	8	4.2V
4	0.4V	9	0.9V
5	0V		

IC12			
1	2.2V	6	0V
2	1.6V	7	0V
3	2V	8	4.6V
4	2V	9	1.6V
5	2V		



Q92			
	VL	VH	U
C	14	0	0
B	0	0.7	1.0
E	0	0	0

SI-F. AVR P.C.BOARD (TNP81234-11)

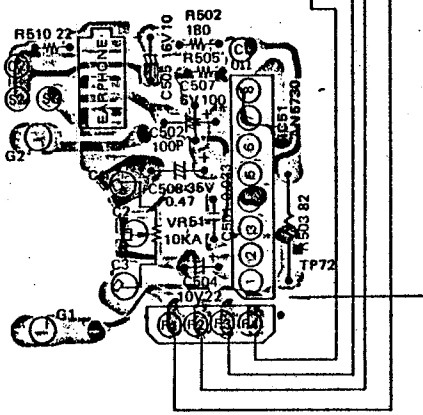


IC21			
1	4.6V	5	2V
2	2V	6	2V
3	4V	7	2V
4	0V		

Q71		Q72	
C	3.3V	C	4V
B	2V	B	3.3V
E	3.2V	E	4.2V

Q73	
C	0V
B	4.2V
E	5V

AUDIO P.C.BOARD (TNP82822-21Z)



IC51			
1	4V	5	0V
2	4V	6	2V
3	0V	7	4.5V
4	1.2V	8	4.5V

This pattern diagram is designed to enable to see the wiring diagram at a glance.

REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the International symbol ⚠ have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

NOTE: The symbol marks (O) on the Replacement Parts List indicate chip parts.

Ref.No.	Part No.	Description
		CABINET AND MAIN CHASSIS PARTS
	TKY807602-1H	Upper Cabinet w/Antenna Holder
	TKY807702-1H	Bottom Cabinet w/Antena Terminal Model Plate
	TKE814802	Escutcheon
	TKG809672	Front Protector
	TKK819815-1	Escutcheon Panel
	TKK819816-1H	Battery. Cover
	TKK819817	Antenna Holder
	TKK800246	Handle
	TKK809431	Set Leg
	TKK800563	Lens Hood
	TKX823901	Indicator Holder
	TKX823702	Battery Box Bracket
	TKX823801	Indicator Bracket
	TMK81980	Speaker Cushion
	TKZ800505	Set Leg Bracket
	TKZ800951	Set Leg Screw
	TUX80862	Set Leg Spring
	TJC80347	Battery Terminal
	TJB80926	Battery Case
	TKZ800309	CRT Band
	TUX80663	Antenna Bracket
	TPG801491	Outer Carton
	TPC813412	Inner Carton
	TXAPD11010P	Filler Compleate
	TQE8589	Set Cover
	TQB811445-1	Fun Bag
	TQB810445-1	Instruction Book
	TQB810476	Safty Sheet
	TNP82822-21X	Tuner P.C.Board
	TNP82822-21Y	Deflection P.C.Board
	TNP82822-21Z	Audio P.C.Board
	TNP81234-11	SI-F, AVR P.C.Board
	TY-NC32P	Car Cord
⚠	TY-AC39P	AC Adapter
⚠	TY-378	Rechargeable Battery
	XEH15A2-B1	Earphone
	TBX80945	Indicator Knob
	TBX80946	On-Off Vol. Knob
	TBX80947	U/V Selector Knob
	TBX80948-1	Cont. Bright. Knob
	TBM80268	Model Plate
	TEK80488-1	Indicator Drum
⚠	40CB4	Picture Tube
⚠	TLY80602A	Deflection Yoke
	TSA800021	Rod Anttena
	EAS45P105S	Speaker 16Ω
	TXAJTC3P398	3P Connector
	TXAJTC4P194	4P Connector
VR51	EVL06BT12A14	On-Off Vol. Control 10KΩA
VR91	EVJLSA806B15	TV. Tuning Control 100KΩB
	TJS825060	CRT. Socket

Ref.No.		Part No.	Description			
			SCREWS & WASHERS			
		XSS26+8BN	Screw (Ant. Cabinet)			
		XTN26+8B	Screw (Indicator, Set Leg)			
		XSS26+4	Screw (Indicator, Drum)			
		XSN17+4	Screw (On-Off Knob)			
		XUC3FT	Nut (Earphone Socket)			
			TNP82822-21X TUNER P.C.BOARD			
			I.C			
IC11		AN5710	Video I-F, AGC			
IC12		AN5720	Video I-F DET-AMP			
IC42		TVSHZT33S1	Zener			
IC91		AN5700	Tuner Band Switch			
			TRANSISTORS			
Q92	O	2SD601A	Switing			
			DIODES			
D81	O	MA57	Diode			
D92	O	MA151WK	Switching			
			COILS & TRANSFORMERS			
L101		TLI801366	Peaking Coil			
L131		TLQ391K126	Peaking Coil	390μH		
L132		TLQ391K126	Peaking Coil	390μH		
L181		TLR80128	Balun Coil			
L301		TLQ391K126	Peaking Coil	390μH		
			CAPACITORS			
C81	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C82	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C92	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C93	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C94	O	ECUX1H102MD	Chip	1000pF	±20%	50V
C95	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C96	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C97	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C98	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C101	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C102	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C103	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C105	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C106	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C131		ECEA0JV471W	Electrolytic	470μF		6.3V
C132	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C133		ECEA1ASS101	Electrolytic	100μF		10V
C134	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C140		ECEA1EK4R7EJ	Electrolytic	4.7μF		25V
C181		ECEA0JK101	Electrolytic	100μF		6.3V
C183		ECSF1AM475C	Electrolytic	4.7μF		10V
C184	O	ECUX1H102MD	Chip	1000pF	±20%	50V
C312		ECEA0JV471W	Electrolytic	470μF		6.3V

Ref. No.		Part No.	Description			
RESISTORS						
R82	O	ERJ8GCJ472	Chip	4.7KΩ	±5%	1/8W
R90	O	ERJ8GCJ105	Chip	1MΩ	±5%	1/8W
R91	O	ERJ8GCJ472	Chip	4.7KΩ	±5%	1/8W
R96	O	ERJ8GCJ105	Chip	1MΩ	±5%	1/8W
R97	O	ERJ8GCJ103	Chip	10KΩ	±5%	1/8W
R98	O	ERJ8GCJ103	Chip	10KΩ	±5%	1/8W
R101	O	ERJ8GCJ820	Chip	82Ω	±5%	1/8W
R111	O	ERJ8GCJ392	Chip	3.9KΩ	±5%	1/8W
R141	O	ERJ8GCJ104	Chip	100KΩ	±5%	1/8W
R180	O	ERJ8GCJ122	Chip	1.2KΩ	±5%	1/8W
R181	O	ERJ8GCJ183	Chip	18KΩ	±5%	1/8W
R182	O	ERJ8GCJ224	Chip	220KΩ	±5%	1/8W
R184	O	ERJ8GCJ102	Chip	1KΩ	±5%	1/8W
R185	O	ERJ8GCJ152	Chip	1.5KΩ	±5%	1/8W
R186	O	ERJ8GCJ331	Chip	330Ω	±5%	1/8W
R188	O	ERJ8GCJ273	Chip	27KΩ	±5%	1/8W
R440	O	ERJ8GCJ272	Chip	2.7KΩ	±5%	1/8W
CONTROLS						
VR19		EVNA1AA00B53	R-F. AGC	5KΩB		
VR92		EVNA6AA00B14	Sub Tuning	10KΩB		
VR93		EVNA6AA00B54	Sub Tuning	50KΩB		
VR94		EVNA6AA00B54	Sub Tuning	50KΩB		
VR95		EVNA6AA00B25	Sub Tuning	200KΩB		
VR96		EVNA6AA00B54	Sub Tuning	50KΩB		
OTHER PARTS						
X91		EXCUVS03J	U/V. Separater			
		TJS828290	DC. Socket			
		TJS868430	3P Socket			
		TNV86907F1N	UHF Tuner			
		TNV16910F1N	VHF Tuner			
		TSE8188	Tuner Ground Spring			
TNP82822-21Y DEFLECTION P.C.BOARD						
I.C						
IC31		AN5760	Vert. OSC-AMP/Output			
IC41		AN5750	Sync. SEP-AMP Horiz. AFC OSC			
TRANSISTORS						
Q14	O	2SD814Q	Video Output			
Q44		2SC2264Q	Horiz. Output			
DIODES						
D15	O	MA151WK	Video			
D31		TVSERA81-004	Rectifier			
D41	O	MA151WK	Pulse Clipper			
D43		TVS08V-100	Damper			
D44	O	MA152K	Rectifier			
D45	O	MA152K	Rectifier			
D46		TVSBB10	Rectifier			
COILS & TRANSFORMERS						
T401	⚠	TLF80958	Flyback Transformer			

Ref. No.		Part No.	Description			
CAPACITORS						
C141	O	ECEA0JK101	Chip	100μF		6.3V
C142	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C143	O	ECUX1H333ZF	Chip	0.033μF	+80 -20 %	50V
C144	O	ECUX1H333ZF	Chip	0.033μF	+80 -20 %	50V
C145	O	ECUX1H471MD	Chip	470pF	+80 -20 %	50V
C301	O	ECUX1H103MD	Chip	0.01μF	±20%	50V
C302	O	ECUX1H153MD	Chip	0.015μF	±20%	50V
C303		ECEA1HK010EJ	Electrolytic	1μF		50V
C304		ECSF1VM334C	Tantalum	0.33μF		35V
C305		ECSF1AM475C	Tantalum	4.7μF		10V
C306		ECSF1AM225C	Tantalum	2.2μF		10V
C307	O	ECUX1H102MD	Chip	1000pF	±20%	1/8W
C308		ECEA0JK330	Electrolytic	33μF		6.3V
C309		ECEA0JV471W	Electrolytic	470μF		6.3V
C311		ECEA1ASS101	Electrolytic	100μF		10V
C313	O	ECUX1H102MD	Chip	1000pF	±20%	50V
C361	O	ECUX1H103MD	Chip	0.01μF	±20%	50V
C362	O	ECUX1H181K	Chip	180pF	±10%	50V
C401	O	ECUX1H333ZF	Chip	0.033μF	+80 -20 %	50V
C402		ECEA1HK010EJ	Electrolytic	1μF		50V
C403	O	ECUX1H101K	Chip	100pF	±10%	50V
C404	O	ECUX1H472MD	Chip	4700pF	±20%	50V
C405	O	ECUX1H153MD	Chip	0.015μF	±20%	50V
C407	O	ECUX1H153MD	Chip	0.015μF	±20%	50V
C408		ECEA1CK100	Electrolytic	10μF		16V
C409		ECEA1ASS101	Electrolytic	100μF		10V
C410	O	ECUX1H153MD	Chip	0.015μF	±20%	50V
C411		ECQK1103JZ	Polyestel	0.01μF	±5%	100V
C413		ECEA1HK010EJ	Electrolytic	1μF		50V
C414	⚠	ECQM2223KZ	Electrolytic	0.022μF	±10%	200V
C415	O⚠	ECUX1H102MD	Chip	1000pF	±20%	50V
C416	O	ECUX1H333ZF	Chip	0.033μF	+80 -20 %	50V
C417	O⚠	ECUX1H222MD	Chip	2200pF	±20%	50V
C418	O	ECEA0JV471W	Chip	470μF		6.3V
C440	O	ECUX1H104MD	Chip	0.1μF	+80 -20 %	50V
C441		ECKD2H391KB9	Ceramic	390pF	±10%	500V
C442		ECEA2AS3R3	Electrolytic	3.3μF		100V
C443		ECKD3A182MD	Ceramic	1800pF	±20%	1KV
C445	O	ECUX1H104MD	Chip	0.1μF	+80 -20 %	50V
C505		ECEA1CK100	Electrolytic	10μF		16V
C601		ECKD2H102KB2	Ceramic	1000pF	±10%	500V
C701		ECEA1CV101W	Electrolytic	100μF		16V
RESISTORS						
R142	O	ERJ18GCJ103	Chip	10KΩ	±5%	1/8W
R143	O	ERJ18GCJ153	Chip	15KΩ	±5%	1/8W
R144	O	ERJ18GCJ102	Chip	1KΩ	±5%	1/8W
R145	O	ERJ18GCJ331	Chip	330Ω	±5%	1/8W
R301	O	ERJ18GCJ273	Chip	27KΩ	±5%	1/8W
R302	O	ERJ18GCJ183	Chip	18KΩ	±5%	1/8W
R303	O	ERJ18GCJ683	Chip	68KΩ	±5%	1/8W
R304	O	ERJ18GCJ224	Chip	220KΩ	±5%	1/8W
R305	O	ERJ18GCJ472	Chip	4.7KΩ	±5%	1/8W
R306	O	ERJ18GCJ392	Chip	3.9KΩ	±5%	1/8W
R307	O	ERJ18GCJ332	Chip	3.3KΩ	±5%	1/8W
R308	O	ERJ18GCJ472	Chip	4.7KΩ	±5%	1/8W
R309	O	ERJ18GCJ472	Chip	4.7KΩ	5%	1/4W

Ref. No.		Part No.	Description			
R310		ERD25TJ2R2	Carbon	2.2Ω	±5%	1/8W
R313	O	ERJ18GCJ391	Chip	390Ω	±5%	1/8W
R360	O	ERJ18GCJ821	Chip	820Ω	±5%	1/8W
R361	O	ERJ18GCJ393	Chip	39KΩ	±5%	1/8W
R401	O	ERJ8GCJ561	Chip	560Ω	±5%	1/8W
R402	O	ERJ8GCJ390	Chip	39Ω	±5%	1/8W
R403	O	ERJ8GCJ103	Chip	10KΩ	±5%	1/8W
R404	O	ERJ8GCJ222	Chip	2.2KΩ	±5%	1/8W
R405	O	ERJ8GCJ273	Chip	27KΩ	±5%	1/8W
R406	O	ERJ8GCJ470	Chip	47Ω	±5%	1/8W
R407	O	ERJ8GCJ272	Chip	2.7KΩ	±5%	1/8W
R408	O	ERJ8GCJ471	Chip	470Ω	±5%	1/8W
R409	O	ERJ8GCJ474	Chip	470KΩ	±5%	1/8W
R441	O	ERJ8GCJ334	Chip	330KΩ	±5%	1/8W
R442	O	ERJ8GCJ334	Chip	330KΩ	±5%	1/8W
R443	O	ERJ8GCJ105	Chip	1MΩ	±5%	1/8W
R444	O	ERJ8GCJ222	Chip	2.2KΩ	±5%	1/8W
R445	O	ERJ8GCJ820	Chip	82 Ω	±5%	1/8W
R510	O	ERJ8GCJ220	Chip	22 Ω	±5%	1/8W
R601	O	ERJ8GCJ105	Chip	1MΩ	±5%	1/8W
R602	O	ERJ8GCJ272	Chip	2.7KΩ	±5%	1/8W
R614	⚠O	ERJ8GCJ225	Chip	2.2MΩ	±5%	1/8W
R615	⚠O	ERJ8GCJ105	Chip	1MΩ	±5%	1/8W
R710	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R711	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R712	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R713	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R714	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R715	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R716	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R717	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W

CONTROLS

VR31	EVNA1AA00B15	Vert. Hold	100KΩB	
VR32	EVNA1AA00B54	Vert. Height	50KΩB	
VR41	EVNA1AA00B13	Horiz. Hold	1KΩB	
VR62	EVNK0BA00B23	Contrast	2KΩB	
VR63	EVNK0BA00B55	Bright	500KΩB	
VR64 ⚠	EVTK4CA00B26	Focus	2MΩB	
VR65 ⚠	EVNK4AA00B55	Aux Bright	500KΩB	

OTHER PARTS

	TJS868540	4P Socket

TNP82822-21Z AUDIO P.C.BOARD

I.C

IC51	TVSM51501L	Audio Output

CAPACITORS

C501	O	ECUX1H333ZF	Chip	0.033μF	+80 -20 % 1/8W
C502	O	ECUX1H102MD	Chip	100pF	±20% 50V
C503		ECEA1AS471	Electrolytic	470μF	10V
C504		ECEA1AK220	Electrolytic	22μF	10V
C507		ECEA0JK101	Electrolytic	100μF	6.3V
C508		ECSF35ER47	Tantal	0.47μF	35V

Ref. No.		Part No.	Description			
RESISTORS						
R502	O	ERJ8GCJ181	Chip	180Ω	±5%	1/8W
R503	⚠	ERD25FJ820	Carbon	82Ω	±5%	1/4W
R510	O	ERJ8GCJ220	Chip	22Ω	±5%	1/4W
		TJS828340	Earphone Socket			

TNP81234-11 SOUND I-F AVR P.C.BOARD

I.C

IC21	AN5730	Sound I-F AMP-DET

TRANSISTORS

Q71	O	2SD601	AVR
Q72	O	2SB709	AVR
Q73		2SB743	AVR

DIODES

D75	TVSRD3R3EB	Zener
D76	MA150	Switching

CAPACITORS

C201	O	ECUX1H121K	Chip	120pF	±10%	50V
C205	O	ECUX1H153MD	Chip	0.015μF	±20%	50V
C207	O	ECUX1H473ZF	Chip	0.047μF	+80 -20 %	50V
C208		ECEA0JK101	Electrolytic	100μF		6.3V
C209	O	ECUX1H103ZF	Chip	0.01μF	+80 -20 %	50V
C215	O	ECUX1H820K	Chip	82pF	±10%	50V
C217	O	ECUX1H473ZF	Chip	0.047μF	+80 -20 %	50V
C702	O	ECUX1H101K	Chip	100pF	±10%	50V
C704		ECEA1EK4R7EJ	Electrolytic	4.7μF		25V

RESISTORS

R201	O	ERJ8GCJ122	Chip	1.2KΩ	±5%	1/8W
R205	O	ERJ8GCJ102	Chip	1KΩ	±5%	1/8W
R212	O	ERJ8GCJ392	Chip	3.9KΩ	±5%	1/8W
R213	O	ERJ8GCJ330	Chip	33Ω	±5%	1/8W
R505	O	ERJ8GC0R00	Chip	0Ω		1/8W
R701	O	ERJ8GCJ391	Chip	390Ω	±5%	1/8W
R702	⚠O	ERJ8GCJ562	Chip	5.6KΩ	±5%	1/8W
R703	⚠O	ERJ8GCJ472	Chip	4.7KΩ	±5%	1/8W
R704	O	ERJ8GCJ471	Chip	470Ω	±5%	1/8W
R705	O	ERJ8GCJ472	Chip	4.7KΩ	±5%	1/8W
R706	O	ERJ8GC0R00	Chip	0Ω		1/8W

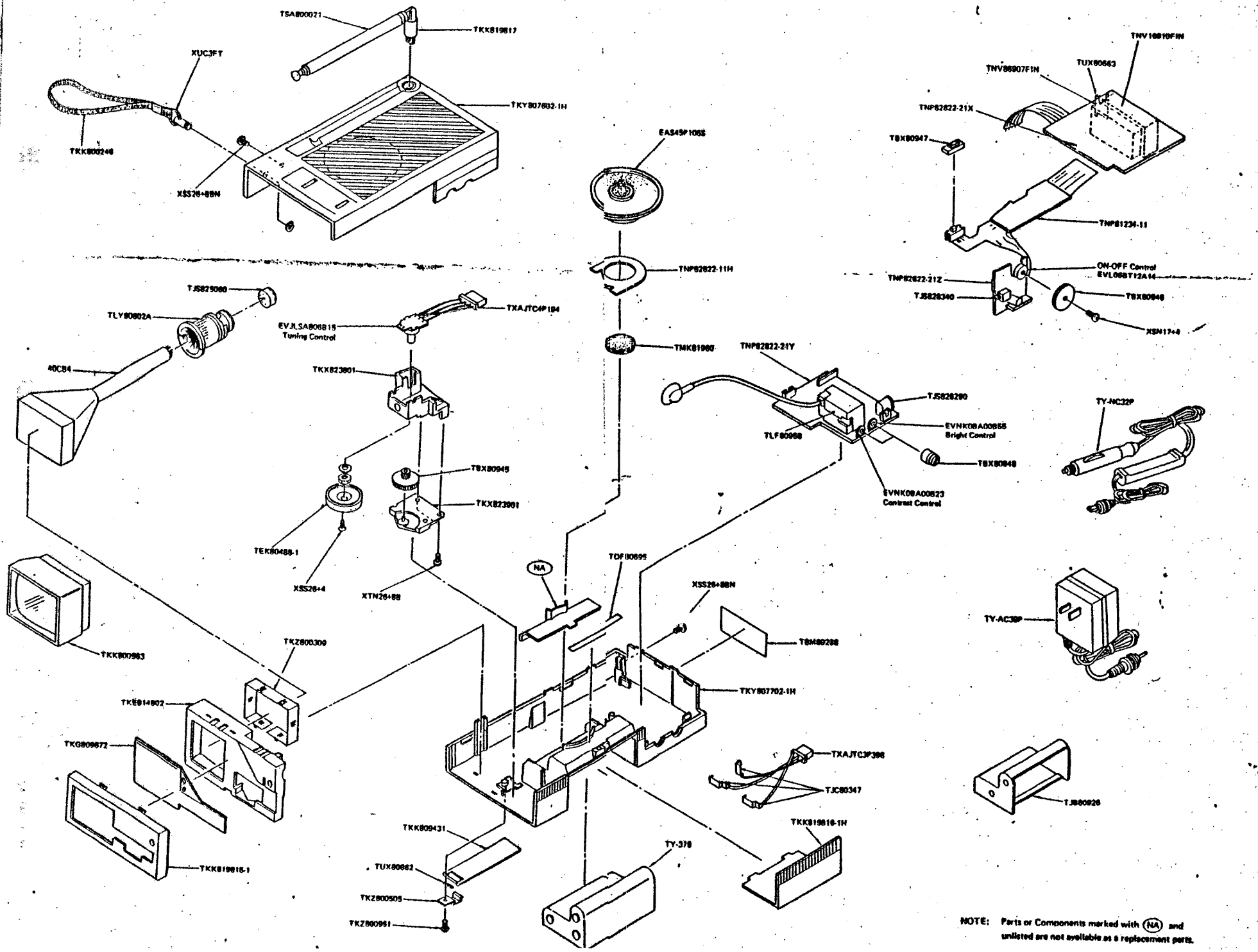
CONTROLS

VR71	⚠	EVNA6AA00B23	AVR Control	2KΩB

OTHER PARTS

SW	TSE80343	Audio Switch
CF21	EFCS4R5MSM	Sound I-F Input Filter 4.5MHz Cerap
CF25	EFCS4R5MCM	Discriminator 4.5MHz Cerap
L201	TLQ100K146	Peaking Coil 10μH
	TMM81925	Bushing A
	TMM81926	Bushing B
	TJS868680	Headphone Adaptor

EXLODED VIEW



NOTE: Parts or Components marked with (NA) and unlisted are not available as a replacement parts.

SCHEMATIC DIAGRAM FOR MODEL TR-1010P (Chassis Model No. 1M01-A) (Chassis Family No. M01)

IMPORTANT SAFETY NOTICE

THE COMPONENTS IDENTIFIED BY SHADING AND THE INTERNATIONAL SYMBOL ⚠ ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THOSE CRITICAL COMPONENTS.

IC91 TERMINAL VOLTAGE

	VHF												UHF					
	2	3	4	5	6	7	8	9	10	11	12	13	14	20	30	40	50	62	83
1	32												25						
2	15					0							13						
3	1.5	3.5	8	12.1	21.2	7.8	8.7	10	11.5	13.4	18.4	21.5	0.75	2.25	5.35	8.0	10.3	13.2	23.7
4	4.3					4							0						
5	0					0													
6	0					3							0						
7	15					2.2							13						
8	32					3.2							12.5						
9	32																		

Q92

	VL	VH	U
C	14	0	0
B	0	0.7	1.0
E	0	0	0

TNP81234-11 SOUND I-F. AVR P.C.BOARD

TNP82822-21Z AUDIO P.C.BOARD

TNP82822-21X TUNER P.C.BOARD

DEFLECTION P.C.BOARD TNP82822-21Y

NOTE

1. RESISTOR
   All resistors are 1/6W, unless otherwise specified. Unit of resistance is ohm(Ω) JR=1.000Ω, M=1,000,000Ω
2. CAPACITOR
   All capacitors are 50V dielectric strength, unless otherwise specified. Unit of capacitance is μF.
3. COIL
   Unit of inductance is μH.
4. TEST POINT
   ○ Test point position.
5. VOLTAGE MEASUREMENT
   Voltage is measured by a volt ohm meter with DC20K Ω/V, receiving normal signal. When all controls are set to the maximum position.
6. When arrow mark (▷) is found, connection is easily found along with the direction of an arrow.
7. This schematic diagram is the latest at the time of printing and subject to change without notice.

IC AND TRANSISTOR BASE INFORMATION

	2SC2284
	2SB743
	AN5730
	M51501L
	AN5700 AN5710 AN5720 AN5750 AN5760

	A=2SB709 Y=2SD601 P=2SD814
	MX=MA157 MH=MA151K MI=MA152K
	MT=MA151WK

AC ADAPTER TY-AC39P

DRY CELL

NI-Cd PACK TY-37B

AN5700

AN5710

AN5720

AN5730

AN5750

AN5760

● Flexible printed wiring board
The green color on the printed circuit board diagram indicates a flexible printed wiring board and parallel feeder. Since the arrow mark indicates the flow of power supply and signal, follow the flow one arrow mark after another, as the diagram below shows. (The number is tentatively used on the circuit diagram.)
"F1" indicates the terminal number of the printed wiring board.

F1